

# Planning and Installation Guide: North Carolina Compressed Natural Gas Fueling Stations

## Introduction

Are you considering installing a compressed natural gas (CNG) fueling station for your fleet? If so, this document will help you begin the process. It highlights the most important factors to consider when planning your station. You will find contact information for resources in North Carolina, including natural gas utilities, fire marshals, and grants specialists. You will also find a checklist of important items to consider when planning for a CNG station.

This document is intended for:

- Fleet managers
- City planners
- Sustainability managers
- Others interested in installing a natural gas fueling station



CNG fueling station under construction in Durham.  
Photo credit: BuildSense

Natural gas infrastructure, which is commonly referred to as fueling stations or filling stations, can offer a number of benefits for your fleet. Fueling on-site is more convenient, saving time and money when vehicles do not have to travel extra miles for refueling. On-site fueling stations are designed to fit the needs of your fleet, and could provide a fuel dispenser for every vehicle and allow trucks to be refilled overnight. The fleet manager may also have greater control over the availability of fuel when the station is privately owned.

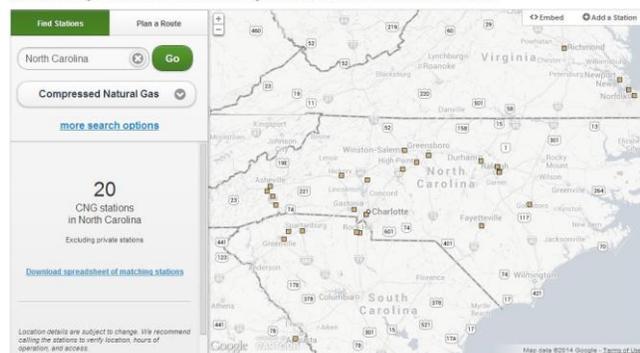
## 1. Is installing a fueling station best for your fleet?

Before investing time, money, and effort into installing a natural gas fueling station, you should be sure that it is the right option for your fleet. There are many public natural gas fueling stations available in North Carolina. One of these stations may be able to provide your fleet with fuel.

One resource for locating and identifying public compressed natural gas fueling stations is the [Alternative Fueling Station Locator](#). This tool is maintained by the U.S. Department of

### Alternative Fueling Station Locator

Find alternative fueling stations near an address or ZIP code or along a route in the United States. Enter a state to see a station count.



There are many public CNG stations in North Carolina.

Energy and shows public CNG fuel stations in a particular area.

While the Alternative Fueling Station Locator will identify stations that are currently available, you should also contact the natural gas utility in your area, and speak with the specialist who works on natural gas as a vehicle fuel at that utility. This individual will be able to give you the most complete information about CNG fueling station availability in your area. At time of publication, the following chart displays the specialists in North Carolina.

Natural Gas Utility	Contact	Title	Phone Number	Email Address
Piedmont Natural Gas	Greg Johnson	Manager, Natural Gas Vehicle Business Development	(704) 731-4392	<a href="mailto:greg.johnson@piedmontng.com">greg.johnson@piedmontng.com</a>
Piedmont Natural Gas	Joe O’Neill	NGV Business Development Representative	(919) 235-6006	<a href="mailto:joe.oneill@piedmontng.com">joe.oneill@piedmontng.com</a>
PSNC Energy	Lee McElrath	Manager, Large Accounts	(828) 670-3525	<a href="mailto:wmcelrath@scana.com">wmcelrath@scana.com</a>
PSNC Energy	Jerry O’Keeffe	Manager, Large Accounts	(919) 598-7444	<a href="mailto:jokeeffe@scana.com">jokeeffe@scana.com</a>

Table 1. Utility contacts for natural gas fueling stations.

There are a number of considerations to installing your own station that could be avoided by using publicly available fueling stations. For example, selecting a vendor, executing a contract, and constructing the station usually take several months. Also, fueling stations are composed of highly specialized equipment so installation can be capital-intensive. Once your station is installed, you may be responsible for maintenance and repairs of the equipment. Your fleet may not be able to fuel when your station is down. All of these costs should be considered before committing to the process of designing your station.



Public CNG filling station in Goldsboro.  
Photo credit: Piedmont Natural Gas.

## 2. Is your site suitable for CNG fueling?

Not all sites are suitable for natural gas fueling stations. In order to determine whether a station is feasible on your site, you should contact the natural gas utility in your area (see Table 1). Regardless of the vendor you select for installing your station, the natural gas will come from one of North Carolina’s regulated utilities. A dialogue with your utility will be useful because they have expertise and local knowledge that will be useful to you in designing your system.

In order to efficiently fuel vehicles on site with natural gas, your location must have sufficient supply and pressure. If natural gas is not available at your site, the utility will conduct a feasibility study to

determine whether facilities can be extended to that site and the delivery pressure the utilities can provide. The availability of higher-pressure natural gas can help in reducing fueling costs. The most common pipeline pressure in North America is 60 pounds per square inch (PSI) for residential, commercial, and industrial use. That gas must be compressed to 3600 PSI to be used as a vehicle fuel. You should speak to your natural gas utility to determine the delivery pressure that the utility can provide. The size of your fleet, the miles those vehicles travel, and the amount of fuel they consume will also be factors.

The most cost-efficient filling stations will be designed specifically for your site, based on the availability of fuel, the fuel pressure, and the needs of your fleet. An elevated delivery pressure, for example, means that less compression needs to take place on-site, which in turn reduces costs. This is why it is important to begin the conversation with your natural gas utility early.

Without long-term planning, you may find that the site and/or fueling capacity of the station you selected may no longer be able to accommodate a larger or heavier-use fleet. Consider incorporating a 'buffer' for fueling capacity and site size (including size/length of routes for vehicles to enter and exit) as you plan your station. This can help avoid needing costly expansions in the near future, or finding yourself with a station sited at a location that cannot accommodate expansion at all. Care must also be taken to avoid building a station that is too large for current and future needs of the fleet. Much of the cost savings from building a CNG fueling station is recovered in the lower cost of fuel use. So if a large, expensive station is built based on an unrealistic expectation of growth in fuel demand and use, return on investment will be significantly impacted.

Another planning consideration is the recent increase in availability of mobile and portable CNG fueling solutions, such as Fuel Mule, Mobile Fueling Solutions, Portable Fuel System, and CNG Express. These types of fueling options are installed more quickly and typically less expensive than building a station from the ground up.

The basic components of a CNG station include:

- Dryer
- Filter
- Compressor
- Storage
- Dispenser

### **3. What does the permitting and inspections process involve?**

#### *Permitting*

Most construction work in North Carolina, including natural gas fueling station projects, requires building permits. You should contact both your city and county governments to enquire about permitting and inspections. You may work with one or both of these offices; the process differs depending on your location. Your natural gas filling station will likely require inspection of footings and foundations, as well as the electrical system, the gas line, and inspection by the fire marshal. The North Carolina Office of the State Fire Marshal maintains [a list of inspectors](#) in every county.

County	Contact	Phone Number
Mecklenburg	Auten, John	(704) 336-2154
Wake	Johnson, Charlie	(919) 856-6340
Guilford	Perdue, Alan	(336) 641-7565
Forsyth	Whicker, Tim	(336) 703-2550
Cumberland	Booth, Gean	(910) 678-7688
Durham	Reid, Edward	(919) 560-4233
Buncombe	Gentry, Terry	(828) 255-5631
Gaston	Hendrix, Eric	(704) 866-3355

Table 2. Fire marshals in North Carolina’s most populous counties<sup>1</sup>

You should contact the planning department responsible for your site as early as possible. By involving them from the start, your local planners can provide input that will be invaluable in planning the components of your system. Some fleet managers have found it useful to invite local planners and inspectors to meet with their station vendor before construction begins. The design and layout of your system will be impacted by national fire codes, such as National Fire Protection Association code [52](#) or [55](#), as well as local building codes. These codes will require minimum distances between your fueling equipment and overhead wires, transformers, your property line, other combustible storage, and so forth. Time and money will be wasted if you fail to take these regulations into account before designing and building your station.

Keep in mind that your natural gas station may be the first in your city or county. As a result, the building and fire marshals might not be familiar with natural gas fueling. You should plan on extra time to consult with these officials. Neighboring businesses owners and residents might also have concerns about the construction of your station. Reach out to them early, explain the construction process and answer any questions. This outreach may prevent complaints later on.

#### 4. What are the options for funding your fueling station?

##### *Public/Private Partnerships*

A funding option to consider is a public/private partnership, which shares the cost of the filling station among the partners. In this case, a municipal government will commit to using a specific amount of natural gas. That government will provide land or land and equipment for a fueling station. A private company will install the filling station, and may be responsible for its maintenance and operations. Other partners may even be brought in, such as additional fleets. One example of this funding strategy is the DeKalb County project in Atlanta, which was conducted in partnership with Atlanta Gas Light and Waste Management.

##### *Private Equity*

A common method for CNG station build-out involves a private company paying 100% to build, own, and operate a compressed natural gas fueling station in an ideal location if a fleet agrees to purchase a certain amount of fuel. The company may combine your fuel purchase with another fleet’s to meet the minimum threshold of CNG. These stations are public accessible and accept CNG fuel cards, major credit cards & Fleet cards. Station providers of this type built a high capacity fueling station in Charlotte located near Westinghouse Blvd & Interstate 77, providing that anchor fleet with a low fuel price in

<sup>1</sup> Source: [http://www.ncdoi.com/osfm/Engineering\\_and\\_Codes/Documents/Find%20a%20NC%20Inspection%20Department.pdf](http://www.ncdoi.com/osfm/Engineering_and_Codes/Documents/Find%20a%20NC%20Inspection%20Department.pdf)

comparison to diesel (CNG on average is 40% less than diesel). If you are interested in this type of partnership, contact the one of the alternative fuels specialists listed in Table 3.

### Grants

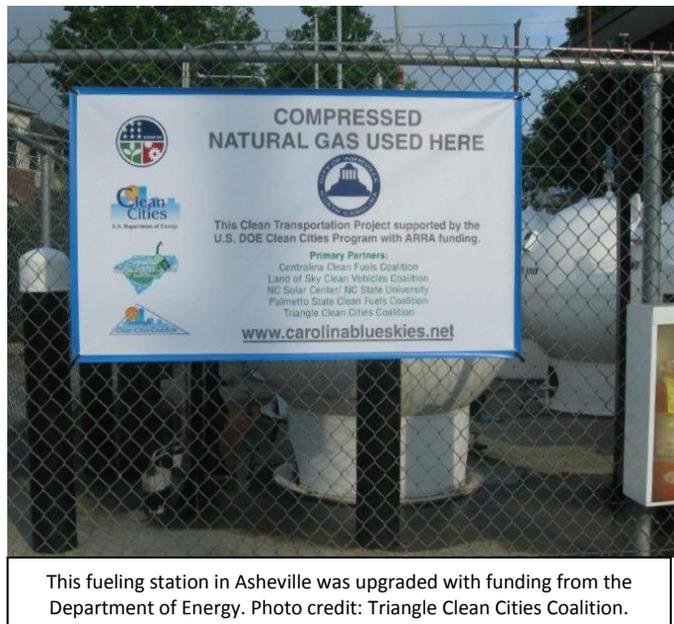
Grant funding and tax incentives can offset the cost of installing your natural gas filling station. To find current information about grants and incentives, contact one of the resources listed in Table 3.

Organization	Location	Contact	Email
<a href="#">Centralina Clean Fuels Coalition</a>	Charlotte	Jason Wager or Sean Flaherty	<a href="mailto:JWager@centralina.org">JWager@centralina.org</a> or <a href="mailto:SFlaherty@centralina.org">SFlaherty@centralina.org</a>
<a href="#">Land-of-Sky Clean Vehicles Coalition</a>	Asheville	Bill Eaker	<a href="mailto:bill@landofsky.org">bill@landofsky.org</a>
<a href="#">North Carolina Solar Center</a>	Raleigh	Andrea Bachrach	<a href="mailto:andrea_bachrach@ncsu.edu">andrea_bachrach@ncsu.edu</a>
<a href="#">Triangle Clean Cities Coalition</a>	Durham	Lacey Jane Wolfe	<a href="mailto:lacey@tjccog.org">lacey@tjccog.org</a>

Table 3. These specialists can help you find grants and other funding for your CNG project, including station and vehicle costs.

When grant funding becomes available, you may have only a few weeks to gather the necessary paperwork and write your application. Every grant application will require slightly different documentation. All the same, it is a good idea to keep the following documents on hand so you will be ready when funding becomes available.

- Valid quotes and specifications from station equipment vendors, on the vendors' letterhead
- Valid quotes and specifications from vehicle vendors, on the vendors' letterhead
- Confirmation from your vehicle vendor that the vehicles or conversion kits have EPA certification
- Timeline for station installation and vehicle deployment. Some North Carolina fleet managers have experienced long wait times for CNG equipment, up to 18 months, so you may want to build a buffer into your timeline.
- Projections for the amount of fuel your station will dispense and/or the fuel your vehicles will use and the miles they will travel.
- Your projected internal costs, such as time your staff will spend managing the project. You may need to commit to covering these costs out of your own budget.



Most grants will involve reporting, such as monthly or quarterly documentation of the amount of fuel you used, the price of the fuel, and the amount of miles your vehicles traveled between fueling. Set

aside time to complete and submit these reports. Grants might also have additional restrictions, so you should review the grant requirements carefully before making a final commitment to the project. Many fleet managers have found grant funding to be worth the time and effort.

#### *Tax Incentives*

The federal fuel excise tax credit has been valuable in the implementation of North Carolina natural gas projects. The credit began in 2006 and has been extended in multiple-year increments. It has even been extended retroactively, as it was in the American Taxpayer Relief Act of 2012.

The tax credit has not been extended for 2014; however, it is possible that this will occur in future legislation. In the past, fleets have been credited \$0.50 for every gallon of alternative fuel used for on-road transportation, including natural gas. Fleets have filed for this credit with their federal taxes. Even tax-exempt fleets, such as municipal governments, have received this credit. The alternative fuels specialists in Table 3 will be able to discuss current tax incentives with you. Before making any decisions based on this information, always consult the Internal Revenue Service or a financial specialist trained in tax law.

### **5. What factors should you consider when selecting your vendor?**

Before selecting a vendor, you may need to release a request for proposals (RFP) or a bid announcement depending on your organization's procurement regulations. This document will ask vendors to estimate the cost of the project as well as list the equipment the vendor proposes to use. You can also request references and speak with the vendors' previous natural gas station clients. Before writing your RFP, you will find it useful to visit another natural gas fueling station. Ask to take a look at their specifications, RFP, and other documents. Below are some factors to consider when writing an RFP.

*Design Specificity:* If you create a fueling station design prior to writing your RFP, you will receive results that are very similar to each other. This will allow you compare different bids more easily, to identify the most cost-effective bid for that particular design. However, this approach may limit your flexibility to consider value-added options.

Another option is to write a request for information (RFI), which will allow each bidder to use the fueling systems they are comfortable with. This may yield cost savings but might also make it more challenging to compare the bids. Each type of fueling system offers distinct benefits in terms of reliability, longevity, and ease of use. The vendor may have experience with a particular system and can explain why these features would be a good fit for your fleet. You can even conduct an RFI to review fuel system options, and then conduct an RFP for the specific system you selected.

*Fuel Availability and Pressure:* If you decide to include a design in your RFP, you should make sure that the delivery pressure specified is available. This may be determined by consulting with your natural gas utility in advance of issuing your RFP (see Table 1).

*Operations and Maintenance:* You should consider how the natural gas station will be operated and maintained. Do you have staff members who are qualified to operate and maintain the equipment? Will you have your staff members trained? You may want to outsource maintenance and repairs to the station vendor. If so, you should include that service in the RFP and in your contract; for example, you can require the vendor to perform preventative maintenance for three years after construction. This requirement should stipulate your maximum wait time for service and assign a fee if the station is not

brought back into service within a reasonable time. If possible, specify a local repair presence that can react quickly to resolve issues. Backup fuel systems with redundant compressors are a great way to minimize the risk of station malfunctions. Compressor maintenance can be costly, too, and will require items such as belts and oil.

*Local Building Codes:* Some vendors will have experience working within the building and fire codes in your city or county. This expertise may be valuable if it helps your project comply with regulations, saving time and money. In any case, you should require your vendor to comply with all local building codes and permitting and the National Fire Protection Association codes 52 and 55, and other national codes.

## **6. Where can you find more information?**

There are a number of great resources available online that can provide you with additional information.

- The [Alternative Fuels Data Center](#) provides more information on [tax breaks, funding, and other incentives](#) available in North Carolina.
- The American Gas Association published an in-depth [CNG Infrastructure Guide](#) that includes information about the history of natural gas, the components of fueling stations, and even includes site plans.
- NGVAmerica offers [information](#) by fleet type, such as airports, refuse, transit and schools.
- The NGV Institute provides a number of [resources](#) for fleets that are considering CNG.

Refer to following page for one page *Checklist for Planning Your CNG Station*

## Checklist for Planning Your CNG Station

### *Public Options and Site Suitability*

- Estimate the amount of fuel your fleet will use and the number of vehicles that will be fueled (today and in the future)
- Search for a publicly available station that can meet your fleet's needs
- Contact the public natural gas utility in your area
- Request an estimate of the delivery fuel pressure at your planned location from your utility
- Contact the planning/permitting department at your city and county governments to determine ingress and egress requirements for your site specific to your vehicle size. If vehicles will access the site from a state road, contact North Carolina Department of Transportation.

### *Permitting and Inspections*

- Contact the planning/permitting department at your city and county governments to find out which office(s) will conduct your permitting and inspections
- Identify building regulations that will influence your station's site design
- Determine which building permits and inspections you will need
- Invite the inspectors, including the fire marshal to meet with your vendor, and to review the site and preliminary plans
- Invite the inspectors, including the fire marshal, to visit your site during the building process
- Reach out to neighboring businesses owners and residents to prepare them for construction process, and to answer any questions or concerns
- Address the inspectors' concerns throughout design and installation process

### *Funding and Incentives*

- Contact the alternative fuels specialist in your area to discuss grant funding and incentives
- Gather documentation necessary for grant applications and keep the documents on file
- Determine whether your staff is able to dedicate time to grant requirements such as reporting
- Public fleets should determine whether a public/private partnership would be beneficial; if so, contact the alternative fuels specialist in your area for a list of potential partners
- Determine whether private equity would be a good fit for your fleet; if so, contact the alternative fuels specialist in your area for a list of potential partners

### *Selecting Vendors*

- Determine whether you will write a Request for Information (RFI) or a Request for Proposals (RFP), or a two-phase approach using both an RFI and an RFP
- Visit an existing CNG station and ask to review their specifications and RFP
- Hold a pre-bid meeting with potential vendors to answer any questions
- Include your site's fuel delivery pressure in any bid requests
- Request references
- Specify responsibilities for station operations and maintenance and consider a three-year preventative maintenance requirement
- Request training for any of your staff who will operate or service the equipment
- Request vendors' familiarity with local building codes and regulations